

91 RF 2840



EG&G ROCKY FLATS

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June 14, 1991

91-RF-2840

Dr. S. P. Singh  
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Oak Ridge, TN 37831

RESPONSE TO COMMENTS ON OPERABLE UNIT NO. 1 (OU 1) UV/PEROXIDE BENCH-SCALE  
TREATABILITY STUDY - CDC-003-91

The following responses and modifications are in reference to your April 19, 1991  
comments on the Project Plan for the OU 1 Bench-Scale Treatability Study. I have attached  
a copy of your comments for your reference.

#### 1. Bench-Scale Perox-Pure Equipment

As we discussed in our April 25, 1991 telephone conversation, conversations with  
Peroxidation Systems, Inc. (PSI) indicated that a styrofoam cover would not fit into  
the Erlenmeyer flask that is used for a reservoir. A second conversation with PSI  
indicated that plastic balls would have to be a 1/8"-1/4" in diameter in order to fit  
past the lines feeding into the flask. PSI indicated that this size of ball is likely to get  
lodged in their lines.

The bench-scale test equipment will initially start out with zero headspace. The  
system is sealed during operation and has a 2-3 psi pressure. Additional samples  
will be taken during the first three test runs. The final confirmation sample will be  
removed after the predetermined residence time, and PSI should not need to remove  
any additional samples. Unless additional sampling is required, the headspace in the  
reservoir during operation will only be from the gases generated by the process and,  
therefore, should be minimal.

I called PSI to talk to them about your comments on calibration. Although a metering  
pump is utilized to deliver the H<sub>2</sub>O<sub>2</sub> to the system, an in-line graduated cylinder is  
used to actually control the H<sub>2</sub>O<sub>2</sub> dosage. No calibration will be required of the  
metering pump or the cylinder, since the graduated cylinder does not vary in  
performance.

DIST.	LTR	ENC
BRETZKE, J.C.		
BURLINGAME, A.H.		
COPP, R.D.		
CROUCHER, D.W.		
DAVIS, J.G.		
EVERED, J.E.	X	
FERRERA, D.W.		
FERRIS, L.R.		
FRAIKOR, F.J.		
FRANCIS, G.E.		
GOODWIN, R.		
HEALY, T.J.		
IDEKER, E.H.		
JENS, J.P.		
KEELE, P.B.		
KERSH, J.M.		
KIRBY, W.A.		
KIRKEBO, J.A.		
LEE, E.M.		
MAJESTIC, J.R.		
MATHEWS, T.A.		
MEURRENS, B.E.		
MORGAN, R.V.		
NORTH, P.		
PALMER, L.A.		
POTTER, G.L.		
PIZZUTO, V.M.		
RHOADES, J.I.		
SAFFELL, B.F.		
SWANSON, E.R.		
WIEBE, J.S.		
WILKINSON, R.B.		
WILLIAMS, R.E.		
WILSON, J.M.		
YOUNG, E.R.		
ZANE, J.O.		
CORRES CONTROL	X	X
TRAFFIC		

CLASSIFICATION:

UCNI	
UNCLASSIFIED	
CONFIDENTIAL	
SECRET	

AUTHORIZED CLASSIFIER  
SIGNATURE

DATE  
IN REPLY TO LTR NO.

None

PC#  
LTR APPROVALS:  
TCG-WH/TCG  
GMA-SP  
ORIG & TYPIST INITIALS  
CDC/PLF

RF-46469 (Rev. 3/91)

ADMIN RECORD

SEARCHED INDEXED CLASSIFICATION/UCNI  
by [signature]  
date [signature]

A-DU01-000175

The rotameter is only used for a rough measurement to determine whether the Reynold's Number is in the turbulent regime. The intensity of UV lights are periodically checked, and we can check on the last calibration of the intensity measuring device prior to witnessing the test.

## 2. Analytical Screening

The analytical screening is to determine pretreatment requirements and to document the concentrations in the samples received. There could be a delay of longer than three days between screening and the initiation of testing. The samples sent to the testing laboratory will have higher concentrations of volatile organic compounds (VOCs) than the predicted treatment concentration to allow for volatilization and to insure that the concentrations are greater than those which the installed equipment will eventually treat. Although the water chemistry will be subject to change prior to the confirmation test, it is the chemical nature of the sample taken prior to the confirmation test that is being evaluated.

The purpose of the composite sampling was to obtain a sample with high enough VOC concentrations to ensure that the test would be performed on greater than average concentrations. It was not to try to get a representative sample of the average volatile concentrations of the groundwater. The samples taken in the field as part of the analytical screening will allow a determination in the change in water chemistry between the sampling event and the confirmation test; however, this information is only secondary to the test itself.

## 3. Pretreatment

If the analytical screening indicates the presence of iron in sufficient quantities to require preoxidation and filtration, a peristaltic pump will be used as opposed to gravity settling. The iron concentrations have historically averaged less than one ppm which should not require any prefiltration.

## 4. Testing Protocol

After sampling and insuring that there is no head space in the feed reservoir, the water will be recirculated in the UV/peroxide unit, and the UV lights will be turned on. After the UV lamps have warmed up and the light has reached full intensity (about ten minutes), the hydrogen peroxide will be added to the system. This will be assumed to be time zero, the assumption being that destruction of the VOCs has not occurred due to the UV radiation alone.

As opposed to taking samples in triplicate, the test has been modified so that a sample will be sent to two different contract laboratories for analysis. These analyses will

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be compared statistically with the results determined by PSI's laboratory. Further details on the statistical method are incorporated in the Quality Assurance Addendum (QAA) currently under preparation. This should also allow for a check on the accuracy of PSI's sampling.

The analytical samples for offsite analysis will be taken at only one residence time during the final confirmation.

#### 5. Testing Report

Based on your comment, I spoke with PSI; they said that they would send all of the raw data as part of the test report.

Thank you for your input on the project plan. I appreciated your quick response and the input that I have received. Currently, a Health and Safety Plan for the field sampling, as well as the previously mentioned QAA, have been prepared and are under review. A schedule for the bench-scale testing will be sent to you when scheduling is finished.



C. D. Cowdery, Senior Chemical Engineer  
Remediation Programs Division  
EG&G Rocky Flats, Inc.

CDC:plf

Attachments:  
As Stated

cc:

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T. T. Olsen	- DOE, RFO
G. M. Anderson	- EG&G Rocky Flats
Q. Erlich	- "
T. C. Greengard	- "